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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/529,779	03/30/2005	Joachim Charzinski	2002P16195WOUS	2265
7590 Siemens Corporation Intellectual Property Department 170 Wood Avenue South Iselin, NJ 08830			EXAMINER CEHIC, KENAN	
			ART UNIT 2616	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/529,779

Applicant(s)

CHARZINSKI, JOACHIM

Examiner

Kenan Cehic

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 March 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 03/30/2005.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Specification

1. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

Drawings

2. Figure 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The

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replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

In addition to Replacement Sheets containing the corrected drawing figure(s), applicant is required to submit a marked-up copy of each Replacement Sheet including annotations indicating the changes made to the previous version. The marked-up copy must be clearly labeled as "Annotated Sheets" and must be presented in the amendment or remarks section that explains the change(s) to the drawings. See 37 CFR 1.121(d)(1). Failure to timely submit the proposed drawing and marked-up copy will result in the abandonment of the application.

Claim Objections

3. Claim 8-11, 19-20 objected to because of the following informalities:

For claim 8, the claim limitation "a router" in line 8 seems to refer back to "router" in line 5. If this is correct it is suggested to applicant to change this limitation to --said router--.

For claim 19, the claim limitation "the last packet" is the first occurrence. It is suggested to applicant to change this to --a last packet--.

Claims 9-11,20 are objected since they depend on objected claims.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 14 recites the limitation "the time" in line 1. There is insufficient antecedent basis for this limitation in the claim.

It is not clear which time the applicant is referring to.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claim 12-15, 19,20 are rejected under 35 U.S.C. 102(e) as being anticipated by Kao et al. (US 7,212,490).

For claim 12, Kao discloses a method for maintaining a sequence of packets (see column 11 lines 15-20 "guarantee the ordering for packets within the same flow" and column 11 lines 21-25 "flow information ensures that packets in a same flow arrive in a proper order at a destination") in a connectionless packet

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switching network (see column 11 lines 34-37 "IP or MPL packet...network") including an alternative routing (see column 11 lines 21-25 "flow information ensures that packets in a same flow arrive in a proper order at a destination" and column 11 lines 21-25 "flow information ensures that packets in a same flow arrive in a proper order at a destination") in the network (see column 11 lines 34-37 "IP or MPL packet...network"), comprising:

storing a receive time (see column 3 lines 22-34 "storing flow information...flow information includes...timer.... period has expired since a last packet in the flow was sent based on the timer") of a first packet (see column 3 lines 22-25 "a packet") received (see column 4 lines 13-17 "receive a packet") by a router (see column 4 lines 13-23 "The node...for routing...determine shortest parth...routing the packet..") as a packet flow time (see column 3 lines 22-34 "timeout period");

selecting a route (see column 3 lines 22-25 "routing decision is made that routes a packet in a direction") for the first packet (see column 3 lines 22-25 "a packet");

storing the selected route (see column 3 lines 22-25 "storing flow information....flow information includes a flow direction selected") based on a packet flow (see column 3 lines 22-25 "flow information") of the first packet (see column 3 lines 22-25 "a packet may be part of a flow");

forwarding (see column 3 lines 22-24 "routes a packet") the first packet (see column 3 lines 22-25 "a packet") to the selected route (see column 3 lines 22-25 "routing decision is made that routes a packet in a direction");

receiving a second packet (see column 3 lines 25-34 "receiving another packet")

belonging to the packet flow (see column 3 lines 27-28 "another packet that is part of the

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flow”) by the router (see column 4 lines 13-23 “The node...for routing...determine shortest path...routing the packet..”) ;

updating the packet flow time (see column 3 lines 27-34 “updating the timer to reflect a start of a new timeout period”) with a receive time (see column 3 lines 27-34 “receiving another packet....routing the another packet...and updating the timer to reflect a start of a new timeout period”) of the second packet (see column 3 lines 25-27 “another packet”); forwarding the second packet (see column 3 lines 25-34 “routing the another packet”) to the stored route (see column 3 lines 25-34 “routing the another packet ...based on the flow information including in a direction determined by the flow direction”); and deleting the stored route (see column 12 lines 3-5 “expired flows are found, then each may be purged from the net flow table” and column 11 lines 14-17 “flow information...in a... flow table” and see column 3 lines 25-34 “routing the another packet ...based on the flow information including in a direction determined by the flow direction”) and the stored packet flow time (see column 11 lines 17-20 “flow information includes...a timer”) after a time from receiving (see column 11 lines 20-23 “ timer is an aging timer that is used to determine when a flow has expired” and column 3 lines 26-29 “ a timeout period has expired since a last packet in the flow was sent based on the timer”) packet in the packet flow (see column 3 lines 26-29 “last packet in the flow”).

As regarding claim 13, Kao discloses wherein the stored route (see column 3 lines 22-25 “storing flow information....flow information includes a flow direction selected” and column 11 lines 14-16 “flow information is maintained in a...flow table”)and stored packet flow time ((see column 3 lines 22-34 “storing flow information...flow information

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includes...timer.... period has expired since a last packet in the flow was sent based on the timer” and see column 3 lines 27-34 “updating the timer to reflect a start of a new timeout period”) are deleted (see column 12 lines 3-5 “expired flows are found, then each may be purged from the net flow table” and column 11 lines 14-17 “flow information...in a... flow table” and see column 3 lines 25-34 “routing the another packet ...based on the flow information including in a direction determined by the flow direction”).

As regarding claim 14, Kao discloses wherein the time (see column 11 lines 24-27 “period of aging time...”) is based on a distribution of a traffic (see column 11 lines 25-29 “aging timer is set to be the longer of the transit delay” and column 11 lines 32-34 “timer...can be initialized wit a maximum value reflective of ...transit delays”)

As regarding claim 15, Kao discloses a router (see column 4 lines 13-23 “The node...for routing...determine shortest parth...routing the packet..”) for maintaining a sequence of packets (see column 11 lines 15-20 “guarantee the ordering for packets within the same flow” and column 11 lines 21-25 “flow information ensures that packets in a same flow arrive in a proper order at a destination”) in a connectionless packet switching network (see column 11 lines 34-37 “IP or MPL packet...network”) including an alternative routing (see column 11 lines 21-25 “flow information ensures that packets in a same flow arrive in a proper order at a destination” and column 11 lines 21-25 “flow information ensures that packets in a same flow arrive in a proper order at a destination”) , comprising:

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a flow table (see column 11 lines 14-16 “flow table”) for storing (see column 3 lines 22-25 “storing flow information...flow information includes a flow direction selected” and column 11 lines 14-16 “flow information is maintained in a...flow table”) and retrieving (see column 3 lines 29-33 “based on the flow information”) a route for route (see column 3 lines 22-25 “storing flow information...flow information includes a flow direction selected”) a packet in a packet flow (see column 3 lines 22-25 “a packet ...part of a flow”;

a first element (see column 11 lines 40 “process” and see figure 3d, 376) for determining if the route is stored (see column 11 lines 49-52 “ “if there is an unexpired flow, the ring direction is determined” and column 11 lines 14-17 “flow information is maintined in ...flow table..and is used in the ring selection process”) in the flow table (see column 11 lines 14-17 “flow information is maintined in ...flow table..and is used in the ring selection process”) for the packet (see column 11 lines 40-43 “packet received”), if the route is not stored (see column 11 lines 52-55 “If there is an expired flow ...or no chached flow(no entry in net flow table)”) a second element (see column 11 lines 40 “process”) selects a packet flow route (see column 11 lines 53-62 “determine if the there is match in the topology table for the detination address...match is detected...determine ring selection and the dynamic ring direction...is used to route the packet”) for the packet (see column 53-62 “the packet”) and subsequently stores the packet flow route (see column 11 lines 65 through column 12 lines 2 “dynamic ring direction is used and an entry is palced in the net flow table) in the flow table (see column 12 line 1 “the net flow table”); and

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a sender for sending (see column 3 lines 29-34 “routing another packet to the destination”) packets (see column 6 lines 30-34 “packets”) along the stored route (see column 3 lines 29-34 “based on the flow information including in a direction determine by the flow direction”).

As regarding claim 19, Kao discloses further comprising a storage unit (see column 12 lines 21-24 “content addressable memory..random access memory”) for storing (see column 12 lines 21-24 “net flow information can be stored”) and retrieving the arrival time (see column 3 lines 28-30 “if a timeout period has expired since a last packet in the flow was sent based on the time”) of the last packet time (see column 3 lines 22-34 “storing flow information...flow information includes...timer.... period has expired since a last packet in the flow was sent based on the timer”) in the packet flow (see column 3 lines 28-30 “in the flow”), the arrival time (see column 3 lines 28-30 “if a timeout period has expired since a last packet in the flow was sent based on the time”) for aging (see column 11 lines 20-23 “ timer is an aging timer that is used to determine when a flow has expired” and column 3 lines 26-29 “ a timeout period has expired since a last packet in the flow was sent based on the timer”) the stored route (see column 12 lines 3-7 “expired flows are found then each maybe purged from the flow table” and column 3 lines 20-25 “flow information includes a flow direction”).

For claim 20, Kao discloses the aging (see column 11 lines 20-23 “ timer is an aging timer that is used to determine when a flow has expired” and column 3 lines 26-29 “ a

timeout period has expired since a last packet in the flow was sent based on the timer”) is based on a time limit (see column 12 lines 7-9 “aging timer has expired” and column 11 lines 24-27 “aging timer is set...transit delay”) after the arrival of the last packet (see column 11 lines 24-30 “last packet” and column 3 lines 26-29 “a timeout period has expired since a last packet in the flow was sent based on the timer”) in the flow (see column 3 lines 26-29 “a timeout period has expired since a last packet in the flow was sent based on the timer”).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

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the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kao et al. (US 7,212,490 B1) in view of, Tsao et al. (US 2002/0131413).

As regarding claim 8, Kao discloses a method for maintaining a sequence of packets (see column 11 lines 15-20 “guarantee the ordering for packets within the same flow” and column 11 lines 21-25 “flow information ensures that packets in a same flow arrive in a proper order at a destination”) in a connectionless packet

Switching network (see column 11 lines 34-37 “IP or MPL packet...network”) including an alternative routing (see column 11 lines 15-20 “guarantee the ordering for packets within the same flow”) in the network (see column 11 lines 34-37 “IP or MPL packet...network”), comprising:

providing a packet (see column 11 lines 34-37 “IP or MPLS packet”) flow (see column 3 lines 22-24 “flow”) having at least a first packet (see column 3 lines 22-24 “a packet may be a part of a flow”) and a second packet (see column 3 lines 22-30 “another packet that is part of the flow”);

receiving (see column 4 lines 13-17 “receive a packet”) the first packet (see column 4 lines 13-17 “a packet”) by a router (see column 4 lines 13-23 “The node...for routing...determine shortest path...routing the packet..”) and selecting a route (see column 3 lines 22-25 “routing decision is made that routes a packet in a direction”) for the first packet (see column 3 lines 22-25 “a packet”);

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storing the selected route (see column 3 lines 22-25 “storing flow information....flow information includes a flow direction selected”) in the router (see column 4 lines 13-23 “The node...for routing...determine shortest path...routing the packet..”); forwarding the first packet (see column 3 lines 22-24 “routes a packet”) along the selected route (see column 3 lines 22-25 “routing decision is made that routes a packet in a direction”); receiving the second packet (see column 3 lines 25-34 “receiving another packet”) by a router (see column 4 lines 13-23 “The node...for routing...determine shortest path...routing the packet..”) and forwarding the second packet (see column 3 lines 25-34 “routing the another packet”) along the stored route (see column 3 lines 25-34 “routing the another packet ...based on the flow information including in a direction determined by the flow direction”);

Additionally, as regarding claim 8, Kao discloses flow information that include route information (see column 3 lines 22-25 “storing flow information....flow information includes a flow direction selected”) .

Kao is silent about:

As regarding claim 8, determining a remaining number of packets belonging to the packet flow ; and deleting the flow information if the remaining number of packets is zero.

Tsao et al. from the same or similar field of endeavor discloses a packet-switched network with the following features:

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As regarding claim 8, Tsao et al discloses determining a remaining number of packets (see section 0035 lines 5-8 “If a flow has no packets”) belonging to the packet flow (see section 0035 lines 5-8 “If a flow has no packets”); and deleting (see section 0035 lines 5-8 “delete the flow identifier”) the flow information (see section 0035 lines 5-8 “delete the flow identifier”) if the remaining number of packets is zero (see section 0035 lines 5-8 “If a flow has no packets”).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Kao et al by using the features, as taught Tsao et al. (US 2002/0131413), in order to provide a scheduling algorithm and apparatus which does not require fixed size packets and exhibits good performance, when there is a high number of packet flows (see Tsao, section 0006 line 8-11).

7. Claim 9,11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kao et al. (US 7,212,490 B1), and Tsao et al. (US 2002/0131413), as applied to claim 8 above, and further in view of Rumphh (US 2007/0204114).

For claim 9 and 11, discloses all the claimed invention as described in paragraph 6.

Furthermore, Kao et al. discloses the router (see Kao, column 4 lines 13-23 “The node...for routing...determine shortest parth...routing the packet..”)

Kao and Tsao are silent about:

As regarding claim 9, wherein the remaining number of packets is based on the packets belonging to the packet flow that are remaining in the router.

As regarding claim 11, wherein the remaining number of packets

is based on the packets belonging to the packet flow that are remaining in a plurality of queues within the router.

Rumph from the same or similar field of endeavor discloses packet processor/egress scheduler with the following features:

As regarding claim 9, Rumph discloses wherein the remaining number of flow packets (see section 0061 lines 24-27 “select...for service, until there are no more remaining packets”) is based on the packets (see section 0061 lines 24-27 “until there are no more remaining packets”) belonging to the packet flow (see section 0061 lines 24-27 “remaining packets in the traffic flow”) that are remaining in the device (see section 0061 lines 24-27 “queues” and Figure 4, Flow Queue 0 through y, “Network Processor”).

As regarding claim 11, Rumph discloses wherein the remaining number of packets (see section 0061 lines 24-27 “select...for service, until there are no more remaining packets”) is based on the packets (see section 0061 lines 24-27 “until there are no more remaining packets”) belonging to the packet flow (see section 0061 lines 24-27 “remaining packets in the traffic flow”) that are remaining in a plurality of queues (see within the device).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of., Kao et al. (US 7,212,490 B1), Tsao et al. (US 2002/0131413), by using the features, as taught Rumph (US 2007/0204114), in order to provide lower cost higher performance solution for a packet scheduler (see section 0022)

and overcome the problems in a scheduler which in an environment with high package throughput such as need to change number of entries of the search to meet customer demands (see section 0014-0020).

8. Claim 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kao et al. (US 7,212,490 B1), Tsao et al. (US 2002/0131413), as applied to claim 8 above, and further in view of Zhao et al (US 2003/0231590).

As regarding claim 10, the claimed invention is described in paragraph 6.

Furthermore, Kao et al. discloses the router (see Kao, column 4 lines 13-23 “The node...for routing...determine shortest parth...routing the packet..”)

Kao and Tsao are silent about:

As regarding claim 10, wherein the remaining number of packets is based on the packets belonging to the packet flow that are remaining in a queue within the device

Zhao et al from the same or similar field of endeavor discloses a scheduling method with the following features:

As regarding claim 10, Zhao discloses wherein the remaining number of packets (see section 0088 lines 7-11 “no more packets queue entries...Thus flow table entry... is not added) is based on the packets (see section 0088 lines 7-11 “packet queue entries) belonging to the packet flow (see section 0088 lines 7-11 “associated with flow”) that are remaining in a queue (see section 0088 lines 7-11 “queue”) within the device (see section 0088 lines 7-11 “DDR scheduler”).

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It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system Kao and Tsao by using the features, as taught Zhao et al (US 2003/0231590), in order to provide an improved technique that does not have scalability problems of existing DDR schemes and to support line rate forwarding for high speed ports with large numbers of queues (see section 0015).

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes Jr. et al. (7,248,586) in view of Kametani (US 7,099,324).

Hughes Jr. et al discloses a router (see column 6 lines 59-61 “router receives and IP packet, packet B1”) for maintaining a sequence (see column 3 lines 46-49 “maintaining order” and see abstract lines 5-10 “packets...flow...forwarded in the order that the router receives them”) of packets (see column 3 lines 46-49 “packets”) in a connectionless packet

switching network packet (see column 5 lines 59-61 “IP packets”) including an alternative routing (see column 3 lines 51-54 “packets ...distinct flow...forwarded in the order the router receives”), comprising:

a flow table (see column 5 lines lines 55-56 “cache”) for storing (see column 7 lines 34-35 “Cache stores the routing information”) and retrieving a route (see column 6 lines 63-66 “ lookup the routing for packet B1...routing information...B1 is forwarded ”) for a packet (see column 6 lines 59-61 “router receives an IP packet, packet B1”) in a packet flow (see column 5 lines 38-40 “Packets B1-B3 belong to a common flow”);

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a first element (see column 5 lines 61-65 "router") for determining if the route (and Figure 4 440, 450 and see column 6 lines 63-65 "cache hit..routing information") is stored in the flow table ((see column 7 lines 34-35 "Cache stores the routing information" and Figure 4, 440,450) for the packet (see column 5 lines 63-65 "packet B1"), if the route is not stored (see Figure 4 , 440,450 "No") a second element (see column 5 lines 55-59 "router") selects a packet flow route (see column 8 lines 1-5 "router proceeds to lookup the destination in the routing table" and see column 5 lines 55-59 "router then first looks up address of packet..in the cache. Because...not cached..lookup in a routing lookup table" and column 3 lines 60-64 "routing information"; here packet A1 was used for illustrating the case where there is not information in the cache for a packet) for the packet (see column 5 lines 63-65 "packet B1") and subsequently stores (see column 7 lines 34-35 "Cache stores") packet flow route (see column 7 lines 34-35 "routing information") in the flow table (see column 7 lines 34-35 "Cache"); and a sender (see Figure 3, 360) for sending packets (see column 7 lines 47-53 "packet reorder buffer...is couple to packet forwarding unit...unit 360 forwards packet" and column 1 line 67 "forwarding the packets" and column 38-40 "packets") along the stored route (see column 5 lines 63-66 "cache hit..routing information...forwarding to the next hop").

Hughes is silent about :

Subsequently stores the packet flow route in the flow table.

Kametani from the same or similar field of endeavor discloses a data searching system with the following features:

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Kametani discloses subsequently stores (see claim 9 lines 40-44 “IP flow table for storing at least one next hop address which has been selected from the routing table”) the packet flow route (see claim 9 lines 40-44 “at least one next hop address which has been selected from the routing table”) in the flow table (see claim 9 lines 40-44 “IP flow table for”). It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Hughes Jr. et al by using the features, as taught Kametani, in order to provide a searching system that allows high-speed searching an updating operation and high speed packet routing operation (see column 2 lines 40-45).

10. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kao et al. (US 7,212,490 B1) in view of Tsao et al. (US 2002/0131413), and Oba et al. (US 6,529,958)

For claim 16, Kao discloses the claimed invention as described in paragraph 5.

Kao is silent about:

As regarding claim 16 wherein the stored route in the flow table is deleted when the packet does not exist in the router.

Tsao et al. from the same or similar field of endeavor discloses a packet-switched network with the following features:

As regarding claim 16, wherein the flow identifier (see section 0035 lines 5-7 “flow identifier”) in the flow table (see section 0035 lines 5-7 lines “service list”) is deleted (see section 0035 lines 5-7 “delete”) when the packet does not exist (see section 0035 lines 5-7 “no packets”) in the router (see section 0035 lines 5-7 “within flow queues” and Figure 1, 100).

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Oba et al from the same or similar field of endeavor teaches a communication method with the following features:

As regarding claim 16, Oba et al disclose a flow identifier (see column 3 lines 34-37 “flow identifier”) that contains route information (see column 3 lines 34-37 “path information”)

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Kao by using the features, as taught, Tsao et al. (US 2002/0131413), and Oba et al. (US 6,529,968) , in order to provide a scheduling algorithm and apparatus which does not require fixed size packets and exhibits good performance, when there is a high number of packet flows (see Tsao, section 0006 line 8-11); and in order to provide scheme which is capable of detecting a loop of the label switched path (see Oba, column 2 lines 46-55).

11. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kao et al. (US 7,212,490 B1) in view of Jin et al. (Us 7,274,700).

For claim 17, the claimed invention is described in paragraph 5.

Koa is silent about:

As regarding claim 17, wherein the router comprises a plurality of flow tables wherein each flow table relates to a queue in the router.

Jin from the same or similar field of endeavor discloses a router with the following features:

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As regarding claim 17, wherein the router (see Figure 1, "Router") comprises a plurality of flow tables (see Figure 1, 501-50m) wherein each flow table (see Figure 1 501-50m) relates (see Figure 1, 60) to a queue (see Figure 1, 70) in the router (see Figure 1, "Router").

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of over Kao et al by using the features, as taught Jin et al. (US 7,274,700), in order to provide reduce the operation load by maximizing the performance of packet classification by minimizing the operation load in a routing process generated due to packet classification and to provide a fast IP packet classification method (see column 1 lines 35-49).

12. Claim 18 rejected under 35 U.S.C. 103(a) as being unpatentable over Kao et al. (US 7,212,490 B1) in view of Jin et al. (Us 7,274,700). as applied to claim 17 above, and further in view of Tsao et al. (US 2002/0131413), and Oba et al. (US 6,529,958)

For claim 18, the claimed invention is described in paragraph 11.

Hughes and Kametani are silent about:

As regarding claim 18, wherein the stored route in the flow table is deleted when the packet does not exist in the queue related to the table.

Tsao et al. from the same or similar field of endeavor discloses a packet-switched network with the following features:

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As regarding claim 18, wherein the flow identifier (see section 0035 lines 5-7 “flow identifier”) in the flow table (see section 0035 lines 5-7 lines “service list”) is deleted (see section 0035 lines 5-7 “delete”) when the packet (see section 0035 lines 5-7 “no packets”) does not exist in the queue (see section 0035 lines 5-7 “within flow queues” and Figure 1, 100). related to the table (see Figure 1 112-112n and 120, 108 and section 0032 lines 3-9 “flow queues...flow identifier from service list”).

Oba et al from the same or similar field of endeavor teaches a communication method with the following features:

As regarding claim 18, Oba et al disclose a flow identifier (see column 3 lines 34-37 “flow identifier”) that contains route information (see column 3 lines 34-37 “path information”).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Hughes Jr. et al. (7,248,586) in view of Kametani (US 7,099,324) by using the features, as taught, Tsao et al. (US 2002/0131413), and Oba et al. (US 6,529,968) , in order to provide a scheduling algorithm and apparatus which does not require fixed size packets and exhibits good performance, when there is a high number of packet flows (see Tsao, section 0006 line 8-11); and in order to provide scheme which is capable of detecting a loop of the label switched path (see Oba, column 2 lines 46-55).

Conclusion

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The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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US-7,190,668 B1	03-2007	Francis et al.	370/229

The above are recited to show packet processing methods/systems.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenan Cehic whose telephone number is (571) 270-3120. The examiner can normally be reached on Monday through Friday 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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KC

KWANG BIN YAO
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read 'Kwang Bin Yao', is written over the printed name and title.